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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/706,937	11/06/2000	Thomas Huber	N0070US	8577

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CHICAGO, IL 60654

EXAMINER	
LE, MIRANDA	

ART UNIT	PAPER NUMBER
2167	

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/706,937	HUBER ET AL.	
	Examiner	Art Unit	
	Miranda Le	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Amendment filed 04/28/06.

Claims 1-6, 8-15 are pending in this application. Claims 1, 2, 14 are independent claims. In the Amendment, claims 1-2, 9-14 have been amended; claim 15 has been added. This action is made Final.

Claim Objections

2. Claims 4, 5, are objected to because of the following informalities: "said improved index" should be changed to "said index". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless:
>
> (e) the invention was described in
>
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or
>
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 11, 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Shaw et al. (US Patent No. 6,684,219).

Shaw anticipated independent claims 1 by the following:

As per claim 14, Shaw teaches an index for data comprising:

a structure that includes a first dimension, a second dimension and a third dimension *(i.e. the spatial features, the non-spatial feature, col. 13, line 47 to col. 14, line 12)*,

wherein said first dimension includes latitude boundary information *(latitude/longitude coordinates, col. 14, lines 13-67)*,

wherein said second dimension includes longitude boundary information *(latitude/longitude coordinates, col. 14, lines 13-67)*,

whereby said data indexed by said structure are searchable using a latitude and a longitude *(i.e. spatially indexed to cluster the data according to spatial proximity, col. 13, line 47 to col. 14, line 67; The user specifies at step 91 a geographic area of coverage, either by coordinate points, longitude/latitude coordinates, or a place name optionally selected from a table of place names, col. 14, lines 13-67)*,

wherein a selectivity of said indexed data is searchable using said third dimension *(i.e. the non-spatial feature data specifies an attribute of the data item and is also capable of being index based on the aggregation hierarchy, col. 13, line 47 to col. 14, line 12; Some queries may involve only the non-spatial aspect of the data, col. 13, lines 13-67)*,

wherein said index being stored on a computer readable medium *(i.e. entity ID, col. 17, line 22 to col. 18, line 26)*.

As per claim 11, Shaw teaches said selectivity is a scale associated with the indexed data *(col. 4, lines 7-30)*.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 4-6, 8-10, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al. (US Patent No. 6,684,219), in view of Ashby et al. (US Patent No. 5,974,419).

As per claim 1, Shaw teaches an index for a geographic database containing data that represent geographic features, said index comprising:

a structure that includes three dimensions *(i.e. the spatial features, the non-spatial feature, col. 13, line 47 to col. 14, line 12)*,

wherein a first dimension of said three dimensions includes latitude boundary information *(latitude/longitude coordinates, col. 14, lines 13-67)*, a second dimension of said three dimensions includes longitude boundary information *(latitude/longitude coordinates, col. 14, lines 13-67)*, said data that represent geographic features indexed by said structure are searchable spatially using a latitude and a longitude *(i.e. spatially indexed to cluster the data according to spatial proximity, col. 13, line 47 to col. 14, line 67)*,

wherein a third dimension of said three dimensions includes rank information, wherein each of said geographic features have an associated rank information, wherein said rank information has at least two levels (*i.e. a feature level of non-spatial attribute data, col. 6, lines 33-54),* said data that represent geographic features indexed by said structure are searchable for said rank of the geographic features (*i.e. the non-spatial feature data specifies an attribute of the data item and is also capable of being index based on the aggregation hierarchy, col. 13, line 47 to col. 14, line 12),*

wherein said index being stored on a computer readable medium *(col. 13, line 47 to col. 14, line 12).*

Shaw teaches said rank information has at least two levels (*i.e. a feature level of non-spatial attribute data).*

Shaw does not specifically teach a first level of rank is associated with the most important geographic features and a second level of rank is associated with geographic features of lesser importance.

Ashby teaches a first level of rank is associated with the most important geographic features and a second level of rank is associated with geographic features of lesser importance *(i.e. The "rank" of a road segment may be related to its functional class with road segments having a rank of "0" being slowest and narrowest, road segments having a rank of "1" being larger and faster, road segments having a rank of "2" being major roads, and so on, col. 7, lines 20-36).*

It would have been obvious to one ordinary skill in the art having the teachings of Shaw and Ashby at the time the invention was made to modify the structure of Shaw to include a first

level of rank is associated with the most important geographic features and a second level of rank is associated with geographic features of lesser importance as taught by Ashby. One of ordinary skill in the art would be motivated to make this combination in order to organize, and store geographic data in view of Ashby, as doing so would give the added benefit of facilitating use of the geographic data for various navigating functions provided by a navigation application program as taught by Ashby *(col. 1, lines 12-20).*

As per claim 4, Shaw teaches improved index is homogeneous *(col. 13, line 47 to col. 14, line 67).*

As per claim 5, Shaw teaches improved index is non-homogeneous *(col. 13, line 47 to col. 14, line 67).*

As per claim 6, Shaw teaches geographic features are roads *(col. 9, lines 39-57).*

As per claim 8, Shaw teaches rank includes fractional values (*col. 10, lines 15-43).* Ashby teaches rank includes integers values (*col. 7, lines 20-36).*

As per claim 9, Shaw does not specifically teach selectivity is a granularity of the indexed data.

Ashby teaches selectivity is a granularity of the indexed data *(col. 19, lines 6-22).*

It would have been obvious to one ordinary skill in the art having the teachings of Shaw and Ashby at the time the invention was made to modify the structure of Shaw to include selectivity is a granularity of the indexed data as taught by Ashby. One of ordinary skill in the art would be motivated to make this combination in order to organize, and store geographic data in view of Ashby, as doing so would give the added benefit of facilitating use of the geographic data for various navigating functions provided by a navigation application program as taught by Ashby *(col. 1, lines 12-20).*

As per claim 10, Shaw does not explicitly teach selectivity is a viewing altitude associated with the indexed data.

Ashby teaches selectivity is a viewing altitude associated with the indexed data *(col. 5, lines 20-37).*

It would have been obvious to one ordinary skill in the art having the teachings of Shaw and Ashby at the time the invention was made to modify the structure of Shaw to include selectivity is a viewing altitude associated with the indexed data as taught by Ashby. One of ordinary skill in the art would be motivated to make this combination in order to organize, and store geographic data in view of Ashby, as doing so would give the added benefit of facilitating use of the geographic data for various navigating functions provided by a navigation application program as taught by Ashby *(col. 1, lines 12-20).*

As per claim 15, Ashby teaches said data that represent geographic features are organize into layers based on said rank associated with the represented features *(col. 6, line 63 to col. 7, line 67).*

7. Claims 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al. (US Patent No. 6,684,219), in view of Dunworth et al. (US Patent No. 5,930,474).

As per claim 12, Shaw does not specifically teach selectivity is an expiration date associated with the indexed data.

Dunworth teaches selectivity is an expiration date associated with the indexed data (col. 24, lines 29-39).

It would have been obvious to one ordinary skill in the art having the teachings of Shaw and Dunworth at the time the invention was made to modify the structure of Shaw to include selectivity is an expiration date associated with the indexed data as taught by Dunworth. One of ordinary skill in the art would be motivated to make this combination in order to efficiently organize information into a consistent presentation and geographically organize information.

As per claim 13, Shaw does not specifically teach selectivity is a creation date associated with the indexed data.

Dunworth teaches selectivity is a creation date associated with the indexed data (23, lines 14-46).

It would have been obvious to one ordinary skill in the art having the teachings of Shaw and Dunworth at the time the invention was made to modify the structure of Shaw to include

selectivity is a creation date associated with the indexed data as taught by Dunworth. One of ordinary skill in the art would be motivated to make this combination in order to efficiently organize information into a consistent presentation and geographically organize information.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al. (US Patent No. 6,684,219), in view of Kothuri et al. (US Patent No. 6,470,344).

As per claim 2, Shaw teaches an index for a geographic database containing geographic data that represent geographic features, said index comprising:

a structure that includes two spatial dimensions and a non-spatial third dimension *(i.e. the spatial features, the non-spatial feature, col. 13, line 47 to col. 14, line 12)*,

whereby said geographic data indexed by said structure are searchable spatially using said two spatial dimensions and a latitude and a longitude *(i.e. latitude/longitude coordinates, col. 14, lines 13-67; spatially indexed to cluster the data according to spatial proximity, col. 13, line 47 to col. 14, line 67)*,

whereby said geographic data indexed by said structure are searchable for a non-spatial property of the indexed geographic data that represent the geographic features using said third dimension, wherein, said non-spatial property of geographic data includes at least one of: a rank associated with the geographic features represented by the geographic data (*i.e. a feature level of non-spatial attribute data, col. 6, lines 33-54)*, a granularity of said indexed geographic data, and a scale associated with said with said indexed geographic data (*i.e. the non-spatial feature data specifies an attribute of the data item and is also capable of being index based on the aggregation hierarchy, col. 13, line 47 to col. 14, line 12)*,

wherein said index being stored on a computer readable medium *(col. 13, line 47 to col. 14, line 12).*

Shaw teaches spatial splay tree indexing and R tree indexing at col. 13, lines 32-46.

Shaw does not specifically teach said structure is a k-d- tree index structure comprising a root node, intermediate nodes and leaf nodes.

Kothuri teaches a structure that is a k-d- tree index structure comprising a root node, intermediate nodes and leaf nodes *(i.e. R-TREE in Fig. 4, col. 3, line 50 to col. 4, line 18).*

It would have been obvious to one ordinary skill in the art having the teachings of Shaw and Kothuri at the time the invention was made to modify the structure of Shaw to include a k-d-tree index structure comprising a root node, intermediate nodes and leaf nodes as taught by Kothuri. One of ordinary skill in the art would be motivated to make this combination in order to provide a method for indexing multi-dimensional data, storing such data in a relational database management system in view of Kothuri, as doing so would give the added benefit of efficiently retrieving the data upon demand as taught by Kothuri *(col. 1, lines 11-14).*

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al. (US Patent No. 6,684,219), in view of Ashby et al. (US Patent No. 5,974,419), and further in view of Kothuri et al. (US Patent No. 6,470,344).

As per claim 3, Shaw teaches spatial splay tree indexing and R tree indexing *(col. 13, lines 32-46).*

Ashby teaches kd tree index *(col. 20, line 52 to col. 21 line 8).*

Shaw and Ashby do not specifically teach a root node, intermediate node and leaf nodes, wherein each node is part of a parent-child relationship wherein each parent node includes control information from which one of at least two child nodes associated with the parent node are distinguishable based on search key.

Kothuri teaches a root node, intermediate node and leaf nodes, wherein each node is part of a parent-child relationship wherein each parent node includes control information from which one of at least two child nodes associated with the parent node are distinguishable based on search key *(i.e. R-TREE in Fig. 4, col. 3, line 50 to col. 4, line 18).*

It would have been obvious to one ordinary skill in the art having the teachings of Shaw, Ashby and Kothuri at the time the invention was made to modify the structure of Shaw and Ashby to include a root node, intermediate node and leaf nodes, wherein each node is part of a parent-child relationship wherein each parent node includes control information from which one of at least two child nodes associated with the parent node are distinguishable based on search key as taught by Kothuri. One of ordinary skill in the art would be motivated to make this combination in order to provide a method for indexing multi-dimensional data, storing such data in a relational database management system in view of Kothuri, as doing so would give the added benefit of efficiently retrieving the data upon demand as taught by Kothuri *(col. 1, lines 11-14).*

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham, can be reached on (571) 272-7079. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Miranda Le
June 22, 2006

JOHN R. COTTINGHAM
PRIMARY EXAMINER